

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 5710-102WO	FOR FURTHER ACTION	See item 4 below
International application No. PCT/US2004/024423	International filing date (<i>day/month/year</i>) 29 July 2004 (29.07.2004)	Priority date (<i>day/month/year</i>) 29 July 2003 (29.07.2003)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant SULLIVAN, James, J.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input checked="" type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Date of issuance of this report 30 January 2006 (30.01.2006)
Facsimile No. +41 22 740 14 35	Authorized officer <div style="text-align: center; font-weight: bold; font-size: 1.2em;">Simin Baharlou</div> Telephone No. +41 22 338 71 30

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
RICHARD C. WOODBRIDGE
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P.O. BOX 592
PRINCETON, NJ 08542

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Applicant's or agent's file reference 5710-102WO		Date of mailing (day/month/year) 11 FEB 2005
		FOR FURTHER ACTION See paragraph 2 below
International application No. PCT/US04/24423	International filing date (day/month/year) 29 July 2004 (29.07.2004)	Priority date (day/month/year) 29 July 2003 (29.07.2003)
International Patent Classification (IPC) or both national classification and IPC IPC(7): G01N 1/10, 35/02, 35/08, 33/48, and US Cl.: 422/180, 48, 54; 422/68.1, 70, 63		
Applicant SULLIVAN, JAMES J		

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

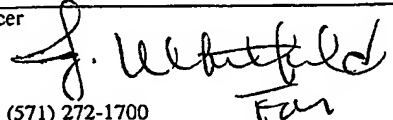
2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Brian Gordon  Telephone No. (571) 272-1700
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Form PCT/ISA/237 (cover sheet) (January 2004)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US04/24423

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ in written format

☐ in computer readable form

c. time of filing/furnishing

☐ contained in international application as filed.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US04/24423

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has:
- ☒ paid additional fees
 - ☐ paid additional fees under protest
 - ☐ not paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
 - ☒ not complied with for the following reasons:
See the lack of unity section of the International Search Report (Form PCT/ISA/210)

4. Consequently, this opinion has been established in respect of the following parts of the international application:
- ☒ all parts.
 - ☐ the parts relating to claims Nos. _____

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/24423

Box No. V Reasoned statement under Rule 43 *bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>2-7, 9-14, 16-21, 23-41</u>	YES
	Claims <u>1, 8, 15, 22</u>	NO
Inventive step (IS)	Claims <u>2-7, 9-14, 16-21, 23-41</u>	YES
	Claims <u>1, 8, 15, 22</u>	NO
Industrial applicability (IA)	Claims <u>1-14</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and explanations:

Please See Continuation Sheet

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/24423

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

V. 2. Citations and Explanations:

Claims 1 and 15 lack novelty under PCT Article 33(2) as being anticipated by Krug et al. US 2004/0014238.

Krug et al. disclose a system for dispensing microdrops of reagent in small, precisely metered quantities maintains the fluid reagent to be dispensed in a reservoir under a controlled pressure. The reagent is dispensed through multiple nozzles connected to solenoid-actuated valves that control the flow of the reagent from the reservoir to the nozzles. Each valve is connected to one of the nozzles and electrical pulses are supplied separately to each of the valves to separately control the opening and closing of each valve to dispense predetermined quantities of the reagent through each nozzle at predetermined times.

Frequently, the microdispensing system will be used to dispense reagent into a microplate (measurement device) having an array of small wells which hold liquid.

In a preferred embodiment of the invention, the reagent in the reservoir is maintained under a controlled pressure by an air pump (pumping means) that supplies pressurized air to the reservoir.

The reagent to be dispensed is contained in a reservoir 10 (preferably a glass container) having a pressurized headspace at the top of the reservoir. An output line 11 leads from a supply line 12 near the bottom of the reservoir 10 to a manifold 13 having eight output lines 14a-14h leading to eight high-speed, solenoid-actuated valves 15a-15h. Each valve 15 carries a dispensing nozzle 16. Whenever one or more of the valves 15 is open, the pressure in the reservoir 10 forces reagent from the reservoir through the line 11 and the manifold 13. Manifold 13 is designed to allow equal flow distribution from the single output line 11 to the eight output line 14a-h and to the open valve(s) 15 to the corresponding dispensing nozzle(s) 16 (sample containers with reservoirs).

Claims 1 and 15 lack novelty under PCT Article 33(2) as being anticipated by anticipated by Wilson US 2003/0162295.

Wilson discloses an injection pump assembly 10 in a chemical delivery system for simultaneously delivering reagents into a combinatorial reactor system having multiple injectors. The assembly 10 has a plurality of injectors 12, each injector 12 being in fluid communication with one of the multiple reactors. Each injector 12 has (1) a pump 14 (pumping means) in which a plunger 18 sealingly moves to ingest, store and discharge a flushing solvent 20; (2) a pipette assembly 22 for loading, storing, and discharging one or more reagents into one of the reactors in the combinatorial reactor system, first and second reservoirs for retaining some of the reagents; (3) one or more hollow needles 32, each for selectively delivering a reagent 24 to the first 28 or the second 24 reservoir; (4) a first valve 34 positioned downstream of the first 28 reservoir; and (5) a second valve 36 positioned downstream of the second 30 reservoir. When each valve 34, 36 is in a closed position, the reagents 24, 48 can be stored in isolation from each other. When each valve 34, 36 is in an open position, the reagents 24, 48 may flow through the pipette assembly 22. A 3-way valve 38 is positioned between the pump 14 and the pipette assembly 22. An actuator assembly 46 is in operable communication with each of the plurality of injectors so that the 3-way valves 38 (first valve which liquid passes through) of each injector may be repositioned in unison, thereby delivering precise amounts of the flushing solvent 20 and the reagents 24, 48 in varied or consistent amounts to each reactor in the combinatorial reactor system (measurement device). The inventive method involves operation of the disclosed injection pump.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/24423

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

assembly.

Turning first to FIGS. 1a-1d and 2a-2d of the drawings, an injection pump assembly 10 is depicted for use in a chemical delivery system which simultaneously delivers reagents into a combinatorial reactor system that has multiple injectors. The injection pump assembly 10 has a plurality of injectors 12. Each injector 12 is in fluid communication with one of the multiple reactors (not shown). Each injector 12 has a pump 14 with a barrel 16 (sample container/reservoir) in which a plunger 18 sealingly moves to ingest, store and discharge a flushing solvent 20.

Claims 1, 8, 15, and 22 lack novelty under PCT Article 33(2) as being anticipated by anticipated by Gjerde et al US 6,419,824.

Gjerde et al. disclose a method for isolating targeted DNA fragments having a predetermined base-pair length from a mixture of DNA fragments comprises the following steps. The mixture of DNA fragments is applied to a separation column containing separation media having a nonpolar, nonporous surface, the mixture of DNA fragments being in a first solution containing counterion and a DNA binding concentration of driving solvent.

FIG. 1 is a schematic representation of a high-pressure system for performing the MIPC method of this invention, with a proportioning valve system for effecting gradients of solvent concentrations in the separation. Chromatographic solutions such as solvents, counterions, and other solutions to be mixed with the solvents are maintained in solvent container 2, carrier liquid container 4, and auxiliary liquid (e.g., a cosolvent) container 6 having respective solvent transport tubing 8, carrier transport tubing 10 and auxiliary liquid transport tubing 12 communicating therewith and leading to degasser 14.

The liquid flows from the containers through respective first valves 26, 28, 30, 40. After such the pump 38 (pumping means) transports the liquid through pump outflow conduit 44 which communicates with the in-line mixer 46, directing the liquid flow through the mixer 46 (sample container/reservoir) for thorough mixing of the components. Mixed liquid outflow conduit 48 communicates with guard column 50 to treat the mixed liquid to remove multivalent metal cations and other contaminants which would interfere with the separation of DNA fragments. Guard column 50 can contain a cation exchange resin in sodium or hydrogen form for removal of multivalent metal cations by conventional ion exchange. Conduit 52 communicates with the outlet of the guard column and an inlet port of a cleaning solution injector valve 54.

In the injector valve 62, the sample is introduced into a stream of solvent and carrier liquid passing through the valve from conduit 60. Sample conduit 70 communicates with an outlet port of injector valve 62 and with the column prefilter 74 in the air bath oven 72. The capillary tubing coil 76 communicates with the prefilter 74 and the inlet of separation column 78 (measurement device).

Claims 2-7, 9-14, 16-21, and 23-41 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a device comprising a housing having an interior chamber connected to a sample inlet, a sample outlet, and a reservoir input/output port; a valve seal located between said sample inlet and said chamber; a hollow needle slideably mounted through said valve seal into said chamber; and a valve ball within said chamber, connected to the end of said hollow needle; whereby a mechanical pressure on the hollow needle tends to remove said valve ball from said valve seal, thereby creating a liquid flow passage through the hollow needle, past the valve ball and seal, to the interior chamber.

Claims 1-41 meet the criteria set out in PCT Article 33(4), and thus meet industrial applicability because the subject matter claimed can be made or used in industry.